Sources and Limitations of Data

CDC Surveillance Data

Much of the information in this document is based on cases of sexually transmitted diseases (STDs) reported to the Division of STD Prevention (DSTD), National Center for HIV, STD, and TB Prevention (NCHSTP), Centers for Disease Control and Prevention (CDC), by the STD control programs and health departments in the 50 states, the District of Columbia, selected cities, counties, U.S. dependencies and possessions, and independent nations in free association with the United States. Included among the dependencies, possessions, and independent nations are Guam, Puerto Rico, and the Virgin Islands. These entities are identified as "outlying areas" of the United States in selected tables and figures.

At present, STD data are submitted to CDC on a variety of hardcopy summary reporting forms (monthly, quarterly, and annually) and electronically either in summary or individual case-listed format via the National Electronic Telecommunications System for Surveillance (NETSS), that provides notifiable disease information that is published in the *Morbidity and Mortality Weekly Report (MMWR)*. DSTD is currently working with project areas on converting from hardcopy reporting of summary data to electronic submission of line-listed (i.e., case-specific) data through NETSS. As of December 31, 2000, 36 states have been reporting primary and secondary (P&S) syphilis, chlamydia and gonorrhea as line-listed extended electronic data. See Figures A1-A3 in this **Appendix** for type of electronic reporting by state and disease. "Summary" refers to aggregate electronic data. "Case" refers to limited case-specific electronic data in conjunction with hardcopy reporting. "Extended case" refers to expanded case-specific electronic data in conjunction with hardcopy reporting. "Discontinued hardcopy" refers to those states that consistently submitted high quality case-extended electronic data and were, therefore, notified by CDC to discontinue hardcopy reporting.

The data used in this report are based on a combination of aggregated NETSS electronic data and summary hardcopy reporting forms. Monthly hardcopy reporting forms included summary data for syphilis by county and state. Quarterly hardcopy reporting forms included summary data for syphilis, gonorrhea, chlamydia, and other STDs by gender and source of report (STD clinic or non-STD clinic) for the 50 states, 64 large cities (most with a population of 200,000 or more persons in 1980), and outlying areas of the United States. Annual hardcopy reporting forms included summary data for P&S syphilis, gonorrhea, and chlamydia by age, race, and gender for the 50 states and six large cities. Provisional data on syphilis, gonorrhea, and chlamydia reported to CDC weekly by states for inclusion in the *Morbidity and Mortality Weekly Report* were not included in this document.

Areas differ in their ability to resolve differences in total cases derived from hardcopy monthly, quarterly, and annual reports (as well as electronically submitted case-listed data). Thus, depending on the database used, there may be discrepancies in the total number of cases among the tables and figures. In most instances, these discrepancies are less than 5% of total reported cases and have minimal impact on national case totals and rates. However, for a specific area, the discrepancies may be larger.

Reports and corrections sent to CDC on hardcopy forms and for NETSS electronic data through May 4, 2001 have been included in this report. Data received after this date will appear in subsequent issues. The data in the tables and figures in this document supersede those in all earlier publications.

Population Denominators and Rate Calculations

Crude incidence rates (new cases/population) were calculated on an annual basis per 100,000 persons. In this report, the 2000 rates for all states, cities and outlying areas were calculated by dividing the number of cases reported from each area in 2000 by the estimated area-specific 1999 population. For the United States, rates were calculated using Bureau of the Census population estimates for 1981 through 1989 (Bureau of the Census; *United States Population Estimates by Age, Sex and Race: 1980-1989* [Series P-25, No. 1045]; Washington: US Government Printing Office, 1990; and *United States Population Estimates by Age, Sex and Race: 1989* [Series P-25, No. 1057]; Washington: US Government Printing Office, 1990). Rates for states and counties were calculated using published intercensal estimates based on Bureau of the Census population estimates for 1980-1989 (Irwin R; 1980-1989 *Intercensal Population Estimates by Race, Sex, and Age*; Alexandria, [VA]: Demo-Detail, 1992; machine-readable data file). Rates for 1990 were calculated using population data from the 1990 census (*Census of Population and Housing, 1990: Summary Tape File 1 (All States*) [machine-readable file]; Washington: Bureau of the Census, 1991), which included information on area (County, State), age (5-year age groups), race (White, Black, Asian/Pacific Islander, American Indian/Alaska Native) and ethnicity (Hispanic). Rates for 1991-2000 were updated from previous issues of this report using postcensal population estimates based on the Bureau of the Census data (*U.S. Bureau of the Census; 1991-1999 Estimates of the Population of Counties by Age, Sex and Race/Hispanic Origin: 1990 to 1999*; machine-readable data files).

The total number of U.S. counties in this report, 3,139, differs from earlier versions of this report which used 3,115 as the total number of U.S. counties. Individual county-level line-listed NETSS electronic data are now available for Alaska. Previously, Alaska syphilis data were collected on the hardcopy reporting forms for only three regions within the state (Southeast, South Central and North).

Many cities do not have a separate health jurisdiction that collects and reports cases of STDs. For these cities, case numbers and crude incidence rates are equal to those of the county or counties in which the city is located. For the remaining cities, incidence rates were calculated by using population estimates based on the Bureau of the Census (Irwin R, see above) and a marketing survey (Market Statistics, Inc; *Sales and Marketing Management*; New York: Bill Communications, Inc, August 1989).

Population estimates for 1980-1988 for areas outside the United States were obtained from the Bureau of the Census (Bureau of the Census; population estimates for Puerto Rico and the outlying areas: 1980 to 1988; *Current Population Reports* [Series P-25, No. 1049]; Washington: US Government Printing Office, 1989). After 1988, population estimates for outlying areas were obtained from the health departments located in these areas. Population estimates for the Virgin Islands were updated through 1997 and were used to calculate the rates for 1997 through 2000. Population estimates for Guam were projected for each year through 2000 based on the 1990 census. Puerto Rico's population estimates from 1997 to 1999 were obtained from the Bureau of the Census.

The percentage of reported cases for which race/ethnicity and age information were missing differed substantially by year and area. States were excluded from comparison across race/ethnicity categories if race/ethnicity data were missing from 50% or more of the state's reported cases. Similarly, states in which age information was missing from the majority of reported cases were excluded from comparison across age categories. Missing values for race/ethnicity and age were imputed for records missing these data for states in which more than half of the reported cases contained race/ethnicity and age information. In previous years, missing age and race/ethnicity information was not imputed if

a record was missing either of these pieces of information. Beginning in 2000, we altered the imputation method so that missing data were not imputed only for records missing both age and sex information. As a result, some age- and/or race/ethnicity-specific case counts and rates presented in this report may differ from earlier publications. Values cited in this report supercede those presented earlier.

Rates of congenital syphilis for 1989-2000 were calculated using live births from the National Center for Health Statistics (NCHS) (Vital Statistics: Natality Tapes 1989-1998 or Vital Statistics Reports, United States 1999, Vol. 48 No.10-Natality). Race-specific rates for 1996-2000 were calculated using live births for 1998. Rates before 1989 were calculated using published live birth data (NCHS; Vital Statistics Report, United States, 1988 [Vol.1—Natality]).

Case Definitions and Reporting Practices

Although most areas generally adhere to the case definitions for STDs found in *Case Definitions for Infectious Conditions Under Public Health Surveillance (MMWR* 1997;46(RR-10):1-56), there are differences between individual areas in case definitions as well as in the policies and systems for collecting surveillance data. Thus, comparisons of case numbers and rates between areas should be interpreted with caution. However, since case definitions and surveillance activities within a given area remain relatively stable, trends should be minimally affected. In many areas, the reporting from publicly supported institutions (e.g., STD clinics) was more complete than from other sources (e.g., private practitioners). Thus, the trends may not be representative of all segments of the population. Military cases are not reported as a separate category.

Reporting of Chlamydia Cases

New York City has been reporting chlamydia cases since 1984. However, the State of New York, with the exception of New York City, initiated chlamydia reporting during the year 2000. As a result, the number of chlamydia cases reported by the state of New York (including the cities of Buffalo, Rochester and Yonkers) may be incomplete and the rate for New York State is underestimated. To be consistent with the practice used in earlier years, we included the incomplete New York State chlamydia reporting data in the calculation of overall national chlamydia rates. The number of chlamydia cases occurring in the fourth quarter of 2000 for the State of Colorado was projected based on case counts from the first three quarters.

Trends in many areas were more reflective of changes in reporting of cases rather than actual trends in disease. Cases and rates of chlamydia reported in gender-specific tables are underestimated due to some reported cases with unknown gender. Despite problems with under-reporting, it is important to publish available data to emphasize the large numbers of cases of chlamydia being detected in the United States. As areas develop chlamydia prevention and control programs, including improved surveillance systems to monitor trends, the data should improve and become more representative of true trends in disease.

Reporting of Gonorrhea Cases

In 1994, Georgia reported gonorrhea cases to CDC for only part of a year. Therefore, Georgia cases and population were excluded from gonorrhea figures and tables for 1994. The city of Atlanta was also excluded from city gonorrhea figures and tables for 1994.

Reporting of Syphilis Cases

"Total syphilis" or "all stages of syphilis" includes primary, secondary, early latent, late (including neurosyphilis, late latent, late with clinical manifestations, and unknown latent), and congenital syphilis. Cases of unknown duration, neurosyphilis, and late syphilis with clinical manifestations have been counted as late and late latent syphilis.

Reporting of Congenital Syphilis Cases

In 1988, a new surveillance case definition for congenital syphilis was introduced. The new case definition has greater sensitivity than the former definition.[1] In addition, many areas greatly enhanced active case finding for congenital syphilis during this time. For these reasons, the number of reported cases increased dramatically during 1989-1991. As is true of any change, a period of transition during which trends cannot be clearly interpreted has resulted; however, all reporting areas had implemented the new case definition for reporting all cases of congenital syphilis by January 1, 1992. Therefore, the reliability of trends is expected to have stabilized after this date.

In addition to changing the case definition, CDC introduced a new data collection form (CDC 73.126) in 1990. Beginning with 1995, the data collected on this form are used for reporting congenital syphilis reported cases and associated rates. This form is used to collect individual case information which allows more thorough analysis of cases. For the purposes of these analyses, if either the race or ethnicity question was answered, the case was included. For example, if "white" race was marked, but ethnicity was left blank, the individual was counted as "non-Hispanic white."

Congenital syphilis cases were reported by state and city of residence of the mother for 1995 through 2000.

Chlamydia, gonorrhea, and syphilis prevalence monitoring

Chlamydia and gonorrhea test positivity for women attending family planning clinics, prenatal clinics, Indian Health Service clinics, the National Job Training Program, the U.S. Army, and men and women entering jail and juvenile detention facilities was calculated by dividing the number of persons testing positive for chlamydia or gonorrhea (numerator) by the total number of persons screened for each disease (denominator) and was expressed as a percentage. Except for the National Job Training Program and Army screening data, the denominators for these data sources may include more than one test from the same individual if that person was tested more than once during a year. Various laboratory test methods were used for all of these data sources except the National Job Training Program and U.S. Army and, for most of the figures shown, no adjustments of test positivity were made based on laboratory test type and sensitivity. However, for Figure 8, the chlamydia test results for each test type were weighted to reflect the sensitivity of the test used.[2] The weights used in this adjustment are the reciprocals of the sensitivities of the laboratory test methods used. These test-specific sensitivities were defined as the midpoints of the range of published values for the sensitivities for each technology type (e.g., non-amplified, nucleic acid amplification, and culture) based on expert consultation regarding test evaluation studies.[3,4] Limitations of this adjustment include: unknown dates when laboratories changed tests, missing information on the test method, variation of test sensitivity within a technology type, and no adjustment for supplemental testing such as negative grey zone testing.

For more details on chlamydia prevalence, refer to the following annual publication: Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2000 Supplement:*

Chlamydia Prevalence Monitoring Project Annual Report 2000. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2001 (in press).

Data on antimicrobial susceptibility in *Neisseria gonorrhoeae* were collected through the Gonococcal Isolate Surveillance Project (GISP), a sentinel system of 25 STD clinics and five regional laboratories located throughout the United States. For more details on GISP gonorrhea cases, refer to the following annual publication: Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2000 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report 2000*. Atlanta, GA: U.S. Department of Health and Human Services, 2001(in press).

Syphilis seroreactivity data on men and women entering jails and juvenile detention facilities were calculated by dividing the number of persons with a reactive syphilis serologic test (numerator) by the total number of persons screened for syphilis (denominator) and expressed as a percentage. These seroreactivity data in most instances do not reflect confirmatory testing and thus biologic false positive test results were not systematically excluded. The extent to which these data reflect prevalence of active syphilis infection varies by site. Further details from each site, including prevalence of high titer infections (> 1:8) which may be more indicative of active infection, are provided in Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2000 Supplement: Syphilis Surveillance Annual Report 2000*. Atlanta, GA: U.S. Department of Health and Human Services, 2001(in press).

Prevalence data for region- and state-specific figures were published with permission from the HHS Regional Infertility Prevention Programs, selected state STD prevention programs, the National Job Training Program, U.S. Department of Labor, U.S. Army, and the Indian Health Service.

Definition of HHS Regions

Health and Human Services (HHS) regions referred to in the text are as follows: Region I = Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; Region II = New Jersey, New York, Puerto Rico, and U.S. Virgin Islands; Region III = Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region IV = Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Region V = Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; Region VI = Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; Region VII = Iowa, Kansas, Missouri, and Nebraska; Region VIII = Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Region IX = Arizona, California, Guam, Hawaii, and Nevada; and Region X = Alaska, Idaho, Oregon, and Washington.

Other Data Sources

The information on the number of initial visits to private physicians' offices for sexually transmitted diseases was based on analysis of data from the National Disease and Therapeutic Index (NDTI) (machine-readable files or summary statistics for years 1966-2000). For more information on this database, contact IMS America, Ltd., 1725 Newton Street, NW Washington, D.C. 20010; Telephone: (703) 356-1269.

The information on patients hospitalized for pelvic inflammatory disease or ectopic pregnancy was based on analysis of data from the National Hospital Discharge Survey (machine-readable files for years 1980-1999), an ongoing nationwide sample survey of short-stay hospitals in the United States, conducted by the National Center for Health Statistics. For more information, see Graves EJ;

1988 Summary: National Hospital Discharge Survey; Advance data No. 185; Hyattsville (MD): National Center for Health Statistics, 1990. The National Hospital Ambulatory Medical Care Survey (NHAMCS-ER) (machine-readable files for 1995-1999) was used to obtain estimates of the number of emergency room visits for pelvic inflammatory disease among women ages 15 to 44. Data on HSV-2 seroprevalence among the non-institutionalized U.S. population were obtained from the National Health and Nutrition Examination Survey (NHANES). The estimates generated using these data sources (NHDS, NHAMCS, and NHANES) are based on statistical surveys and therefore have sampling variability associated with the estimates.

Healthy People Year 2010 Objectives

In January 2000, CDC released objectives for Healthy People 2010 (HP2010).[5] The year 2010 rate objectives for the diseases addressed in this report are: primary and secondary syphilis— 0.2 case per 100,000 persons; congenital syphilis—1.0 case per 100,000 live births; and gonorrhea—19.0 cases per 100,000 persons. An additional target established in the HP2010 objectives is to reduce the *Chlamydia trachomatis* test positivity to 3.0% among females aged 15 to 24 years who attend family planning and STD clinics and among males aged 15 to 24 who attend STD clinics (Table A1).

Urban-Rural Categorization Method

Aggregate county-specific case report data on P&S syphilis are submitted monthly by state health departments (via Form CDC-73.998) to the Centers for Disease Control and Prevention (CDC). These P&S syphilis case report data were summarized using urban-to-rural continuum codes for metro and nonmetro counties that were developed by the U.S. Department of Agriculture (USDA)[6] and incorporated the Office of Management and Budget's (OMB) official metro status based on the results of the 1990 Population Census.[7] The 1993 urban-rural continuum codes form a classification scheme that distinguishes metropolitan counties by size, and nonmetropolitan counties by degree of urbanization and proximity to metro areas. The standard Office of Management and Budget (OMB) metro and nonmetro categories have been subdivided into four metro and six nonmetro categories.[6] The county-specific USDA codes used to place counties into urban-to-rural categories are as follows:

U.S. Department of Agriculture Urban-to-Rural Continuum Codes for Metro and Nonmetro Counties (as of June 1993)

Code	Metro Counties:
0	Central counties of metro areas of 1 million population or more
1	Fringe counties of metro areas of 1 million population or more
2	Counties in metro areas of 250,000 to 1 million population
3	Counties in metro areas of fewer than 250,000 population
	Nonmetro Counties:
4	Urban population of 20,000 or more, adjacent to a metro area
5	Urban population of 20,000 or more, not adjacent to a metro area
6	Urban population of 2,500 to 19,999, adjacent to a metro area
7	Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Completely rural or fewer than 2,500 urban population, adjacent to a metro area
9	Completely rural or fewer than 2,500 urban population, not adjacent to a metro area

An aggregate urban category (codes 0, 2, and 3) was defined to include central counties with at least one million or more persons (code 0) and non-fringe counties in metro areas (codes 2 and 3).

Fringe metro counties (code 1) were combined with the nonmetro counties adjacent to a metro area and with an urban population of at least 2,500 population (codes 4 and 6) to form an aggregate category designated as peri-urban (codes 1, 4, and 6). An aggregate peri-rural category was defined to include nonmetro counties not adjacent to a metro area and with an urban population of at least 2,500 population (codes 5 and 7), and an aggregate rural (codes 8 and 9) category was defined to include nonmetro counties that were completely rural or had fewer than 2,500 urban population.

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[1]Kaufman RE, Jones, OG, Blount, JH, Wiesner PJ. Questionnaire survey of reported early congenital syphilis: problems in diagnosis, prevention, and treatment. *Sex Transm Dis* 1977;4:135-9.

[2]Webster Dicker L, Mosure DJ, Levine WC, Black CM, Berman SM. The impact of switching laboratory tests on reported trends in *Chlamydia trachomatis* infections. Am J Epidemiol 2000;151:430-435.

[3]Newhall WJ, DeLisle, S, Fine D, et al. Head-to-head evaluation of five different non-culture chlamydia tests relative to a quality-assured culture standard. *Sex Trans Dis* 1994;21:S165-6.

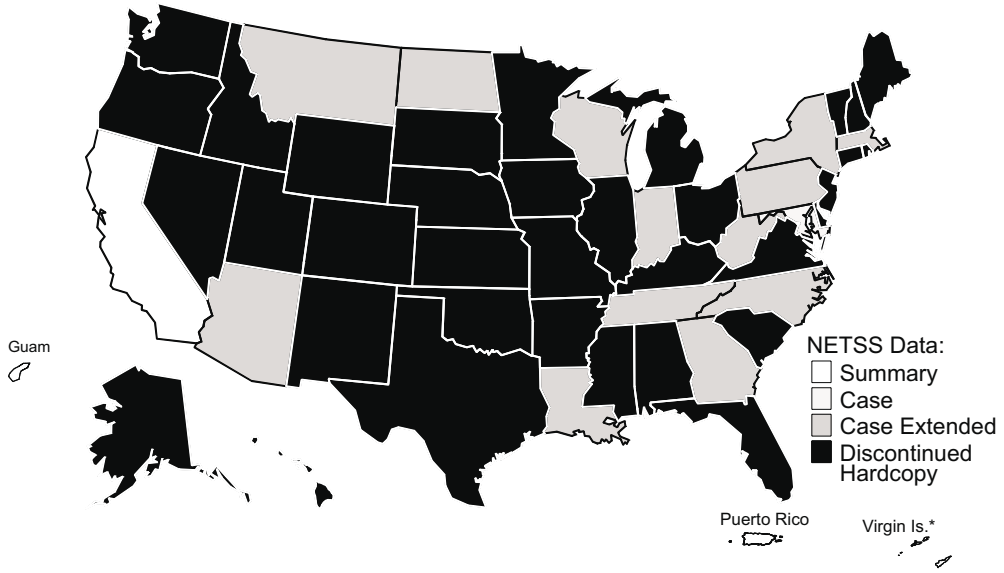
[4]Centers for Disease Control and Prevention. 2001 Guidelines for the Laboratory Detection of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhea* (GC) Infections. (In preparation).

[5]U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

[6]Rural-Urban Continuum Codes for Metro and Nonmetro Counties, 1993. Butler MA, Beal CL, Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES 9425, September 1994.

[7]Federal Register, Part IV, Office of Management and Budget, Revised Standards for Defining Metropolitan Areas in the 1990's. Vol .55 No.62, Friday March 30, 1990.

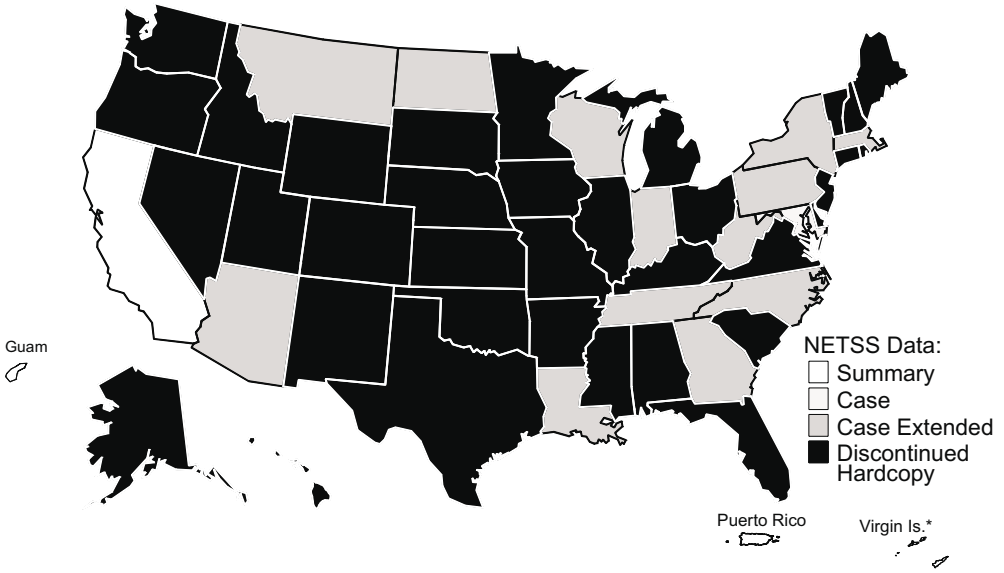
Figure A1. Chlamydia — National Electronic Telecommunications System for Surveillance (NETSS) transmission status by state, 2000



*Virgin Islands did not report.

Note: Unless noted, large city projects transmit records in the same format as states. San Francisco and Los Angeles projects report case extended chlamydia records to NETSS.

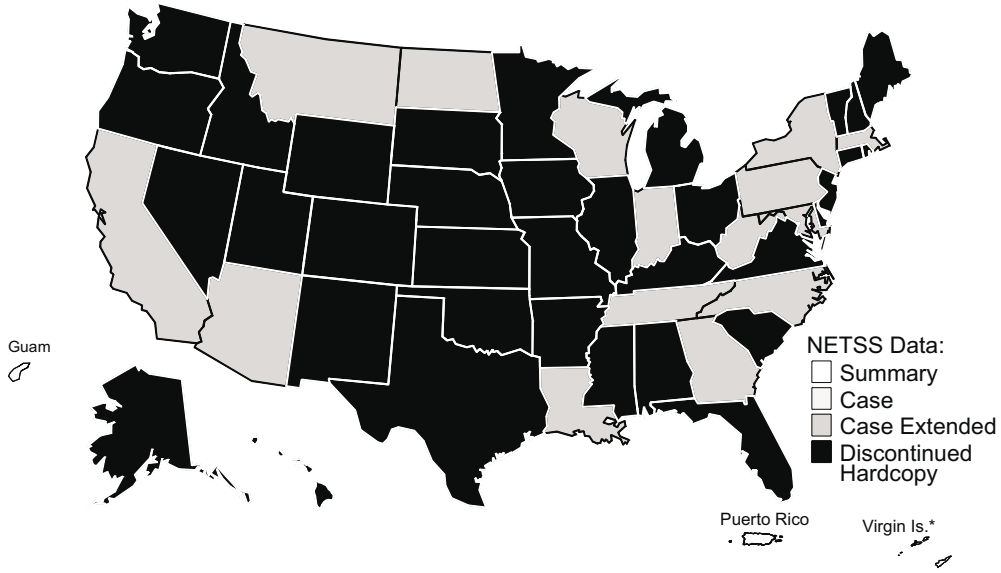
Figure A2. Gonorrhea — National Electronic Telecommunications System for Surveillance (NETSS) transmission status by state, 2000



*Virgin Islands did not report.

Note: Unless noted, large city projects transmit records in the same format as states. San Francisco and Los Angeles projects report case extended gonorrhea records to NETSS.

Figure A3. Primary and secondary syphilis — National Electronic Telecommunications System for Surveillance (NETSS) transmission status by state, 2000



*Virgin Islands did not report.

Note: Unless noted, large city projects transmit records in the same format as states.